

HYDE HALL BRIDGE  
National Covered Bridges Recording Project  
Spanning Shadow Brook, former East Lake Road  
East Springfield  
Otsego County  
New York

HAER NY-330  
*NY-330*

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD  
National Park Service  
U.S. Department of the Interior  
1849 C Street NW  
Washington, DC 20240-0001

# HISTORIC AMERICAN ENGINEERING RECORD

## HYDE HALL BRIDGE

HAER No. NY-330

LOCATION: Spanning Shadow Brook, former East Lake Road, East Springfield,  
Otsego County, New York  
UTM: 18.511154E.4737522N, East Springfield, NY Quad

STRUCTURAL  
TYPE: Wood covered bridge, Burr arch-truss

DATE OF  
CONSTRUCTION: Probably 1825

DESIGNER/  
BUILDER: Cyrenus Clark, Otsego, New York

PRESENT OWNER: State of New York

PREVIOUS USE: Vehicular bridge

PRESENT USE: Pedestrian bridge, bypassed in 1965

SIGNIFICANCE: The Hyde Hall bridge was reportedly built in 1825 as part of the 1817-1835 construction of George Hyde Clarke's country estate, Hyde Hall, on the northern shore of Otsego Lake near Cooperstown, New York. It is believed to be the oldest extant wooden covered bridge in the United States. Hyde Hall, a National Historic Landmark, is considered the finest example of a neo-Classical country estate in the country.

HISTORIAN: Researched and written by Lola Bennett, Summer 2002

PROJECT  
INFORMATION: The National Covered Bridges Recording Project is part of the Historic American Engineering Record (HAER), a long-range program to document historically significant engineering and industrial works in the United States. HAER is administered by the Historic American Buildings Survey/Historic American Engineering Record, a division of the National Park Service, U.S. Department of the Interior. The Federal Highway Administration funded the project.

See also HABS NY-260, Hyde Hall and HABS NY-263, Hyde Hall, Covered Bridge.

## **Chronology**

1825—Bridge presumably built to span Springfield Creek

1955—Work being done on foundation of bridge when George Hyde Clark died

1963—Property acquired by State of New York. Covered bridge becomes part of Glimmerglass State Park

1960s—Bridge receives new siding and roof

1993—Bridge jacked up; abutments rebuilt using original stone

1994—Fencing installed inside trusses

## Description<sup>1</sup>

The Hyde Hall Bridge is a single-span Burr arch-truss wooden covered bridge on stone abutments. The total length of the structure is 53'-6", with a clear span of 39'-0". The truss is 11'-0" high center-center of the chords and 15'-10" wide out-out, with a roadway width of 13'-6".

The bridge is framed in the manner patented by Theodore Burr in 1817. The bridge's principal structural components are a pair of segmented timber arches framed into and around a pair of X-panel trusses to create an indeterminate composite timber structure.<sup>2</sup> The arches spring from the facewall of the abutments, rise approximately 9'-0" to the crown and span 39'-0". Each arch is composed of 6x14" paired timbers that are notched around the vertical posts and bolted through the diagonal braces.

The upper chord is composed of paired beams notched around the posts and pinned with treenails. The lower chord is comprised of paired 7x12" beams that are notched around and bolted at the posts. The posts are 6 1/2x9" wooden timbers notched into the arch and around the lower chord. The braces and counterbraces are notched into the posts about 8' above the deck. The posts and diagonals form six panels spaced 6'-6" on center, plus two end panels without diagonal braces.

The floor system is composed of 6 x 10" transverse wooden floor beams resting on top of the lower chord at each panel point. Variable-width rough-sawn plank flooring is laid longitudinally on the beams. The stone abutments sit on poured concrete footings. The lower chords of the bridge rest on top of the facewalls of the abutments where they are notched into and around and bolted to the ends of the arches.

The upper lateral system is composed of tie beams that are seated on the posts, with sway braces between the posts and tie beams. Rafters are fastened to wooden blocks on top of the upper chord and support the gable roof. The gable roof consists of asphalt shingles covering an earlier layer of wood shingles, which are nailed to purlins on top of the rafters.

Clapboards cover the exterior of the bridge to the eaves. The clapboards are fastened to vertical nailers on the outer faces of the trusses. The portals are straight with projecting pediments and arched openings.

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<sup>1</sup> Wire fencing has been installed inside the trusses, presumably to reduce vandalism, so there is no access to measure or examine them closely.

<sup>2</sup> According to covered bridge historian Joseph Conwill, "Burr experimented with a variety of designs, but his earliest form of the truss we now call a Burr truss, [had] counterbraces. ... The fact that this is an early Burr truss is a contributing piece of evidence for the 1825 construction date... On rare occasion, later Burr trusses were built with counterbraces...but this is unusual after the 1820s."

## New York Covered Bridges

In Covered Bridges of the Northeast, bridge historian Richard Sanders Allen states that Theodore Burr “was the dominant figure of early bridge building in New York.”<sup>3</sup> In 1804, Burr built the first arch-truss wooden bridge in New York State, across the Hudson at Waterford. Three years later, Maj. Salmon Wheat built New York’s first covered bridge, a 160’, double barrel structure with a single arch at Bridgeville. In 1811, Burr completed a covered bridge with three massive timber arches over Schoharie Creek at Esperance in Schoharie County.

At least 250 covered bridges are known to have existed in New York State.<sup>4</sup> By 1942, floods, fires, and neglect had taken their toll and only forty-six covered bridges remained.<sup>5</sup> According to the World Guide to Covered Bridges, today there are thirty-two surviving examples, with the majority located in and around the Catskills. Their dates range from the reported 1825 date to 1991, with the majority (53 percent) representing the period from 1850-1880. They represent many truss types, Town having the strongest representation with sixteen examples. The Hyde Hall Bridge is one of only two surviving examples of the Burr arch-truss type.<sup>6</sup>

## Site History

Hyde Hall was built for George Clarke (1768-1835) whose great-grandfather was secretary and lieutenant governor of the Province of New York from 1703 to 1743. The land he amassed, totaling some 120,000 acres, became the basis of a family fortune that financed the construction of the Hyde Hall estate, which remained in the possession of the Clarke family for nearly 150 years.

In 1806, Clarke emigrated from England and settled in Albany. Seven years later, he married Anne Cary Cooper, the widow of James Fenimore Cooper’s brother, and shortly thereafter, Clarke purchased 380 acres of property 7 miles from Cooperstown on the northern tip of Otsego Lake. On this land he hoped to build a country house called Hyde Hall after the family’s home by the same name in Cheshire, England. He commissioned upstate New York’s most highly regarded architect, Philip Hooker of Albany, to draw up the plans. Designed as a neo-Classical English country manor house, Hyde Hall was “possibly the largest domestic structure built in America between the Revolution and the Civil War” and “had no equal in its time.”<sup>7</sup> From this estate, Clarke would run an empire that included large tracts of land in New York State, coalmines in England and sugar plantations in Jamaica. Local craftsmen used local materials to build Hyde Hall from 1817 to 1835.

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<sup>3</sup> Richard Sanders Allen, Covered Bridges of the Northeast (Brattleboro, VT: Stephen Greene Press, 1957), p.80.

<sup>4</sup> Allen, Covered Bridges of the Northeast, p.80.

<sup>5</sup> Richard Sanders Allen, “New York State Covered Bridges,” Highway Topics, December 1942.

<sup>6</sup> A third example at Salisbury Center has arches that were added later.

<sup>7</sup> Friends of Hyde Hall, Inc., “Hyde Hall,” visitor’s brochure, 1997.

## Construction of Hyde Hall Bridge

Once the house was underway, Clarke began developing the grounds of the estate. In his 1917 history of Cooperstown, Ralph Birdsall described the grounds as follows:

The grounds of Hyde Hall lie toward the head of Otsego, on the eastern side, where Hyde Bay increases the width of the lake by a generous sweep of rounded shore. Into this bay from the east flows Shadow Brook, the most picturesque stream of water in the region, whose pellucid current reflects clear images of foliage and sky, and offers a favorite resort, in shaded nooks, to the drifting canoes of lovers. In a clearing of the woods farther northward along the shore, and at a good elevation, stands Hyde Hall, facing the southeast across the bay. ...The house commands a superb view of the lake, and is surrounded by beautiful old trees and forest land. Upwards of three thousand acres belonging to Hyde Hall enclose it on all sides, and the residence is approached by three private roads averaging over a mile in length.<sup>8</sup>

The roads Birdsall refers to were laid out in the early 1820s to improve access to various parts of the property as well as to provide connections to the regional highway network. A gatehouse at East Lake Road provided a grand entrance to the estate, and it was this road that crossed Shadow Brook at the head of Otsego Lake. According to Martin Rykeil's research in the George Hyde Clark family papers for his 1996 thesis, "Building Hyde Hall, 1817-1835,"

Clarke's Hyde roads became part of the Otsego Lake Turnpike, a toll road connecting the Second Great Western Turnpike and Cherry Valley Turnpike which he organized in 1822 with hopes of profiting from the three-mile stretch through his estate.<sup>9</sup>

Cyrenus Clark, the contractor for much of the masonry and woodwork at Hyde Hall, built many of the outbuildings and was also the contractor for the bridge.<sup>10</sup> According to Rykeil, "Clarke's Hyde tenants helped construct his buildings using lumber, stone, and brick from the property."<sup>11</sup> In the Hyde and Houghton estate accounts, Edward Hyde Clarke (George Clarke's son) recorded the following expenditures from his home in Cheshire, England:

Feb 1, 1825—Bridge at Hyde £100

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<sup>8</sup> Ralph Birdsall, *The Story of Cooperstown* (New York: Charles Scribners Sons, 1917), p.232-34.

<sup>9</sup> Martin J. Rykeil, "Building Hyde Hall, 1817-1835: George Clarke's Country Estate, Otsego County, New York," M.A. Thesis, State University of New York at Oneonta, Cooperstown Graduate Program, 1996. There are conflicting opinions as to whether or not this was a toll bridge. Russ Patton Jr. states in "Hyde Hall Bridge Spans the Ages," *Kaatskill Life*, Winter 1996-97, "the Hyde Hall Bridge was on private land and never was a toll bridge." [p.63].

<sup>10</sup> George Hyde Clarke Family Papers, Manuscript Collection 2800, Department of Archives and Manuscripts, Olin Library, Cornell University, Ithaca, New York.

<sup>11</sup> Rykeil, p.30.

May 1, 1825—Bridge at Hyde £150  
Nov 1, 1825—Bridge (remainder due on) £134<sup>12</sup>

In addition, the following bills and receipts appear in the papers for 1825:

April 8, 1825—To Barnes Baird, to drawing logs for bridge 1.25

May 9, 1825—Recd of George Clarke Esq. Seven dollars for stone and drawing  
the same to make his bridge near the turnpike road. O.P. Lampman

Bill for Stone for the Bridge near the turnpike on the McCullum lot, paid May 9,  
1825. \$7—Lampman, Hyde<sup>13</sup>

Sept 18, 1825--to Msrs. Daniel and James Gilchrist. Mar. 20, 127 sft of 3 inch  
plank for bridge \$19.17; Apr—Bridge plank 100 feet boards \$1.08

Presumably, these are all references to the present covered bridge, although it is not known if any other bridges were built on the estate, and there is no conclusive proof to date that the bridge over Shadow Brook was originally, in fact, a covered bridge.<sup>14</sup> More extensive research in the family papers is needed to rule out the possibility that the present bridge was built at a later date.

### **Subsequent History of the Bridge**

No documentation has been found concerning maintenance and repair of the Hyde Hall Bridge, but presumably at least some of these records would be in the George Hyde Clarke family papers. The Historic American Buildings Survey (HABS) documented the bridge in 1961 (see HABS No. NY-263) . At that time, the structure was said to be “unpainted and in poor condition.” At an unknown date between 1961 and 1972, the state rehabilitated the bridge as part of the development of Glimmerglass State Park, of which it is now part. In his notes on the Hyde Hall Bridge, covered bridge historian Joseph Conwill states, “When I first saw Hyde Hall Bridge in 1972 the housing was recent and the abutments also appeared to have had recent work.”<sup>15</sup>

Following the death of George Clarke in 1955, the family held on to the property for a few years until the passage of the New York State Land Acquisition Act in 1963, under which the state acquired the property at the head of Otsego Lake where they proposed to develop a state park.<sup>16</sup> Shortly thereafter, Friends of Hyde Hall incorporated as a nonprofit organization to assist with

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<sup>12</sup> George Hyde Clarke Family Papers, Box 38, Folders 1 and 3.

<sup>13</sup> This location is confirmed as the Shadow Brook (Springfield Creek) bridge site on a survey map labeled “G.H.I.O. Represents Lot No. 2 and part of Lot No. 1 which was conveyed by David McCollum to George Clark by deed dated April 1<sup>st</sup> 1825 containing 53 acres” in the George Hyde Clarke family papers.

<sup>14</sup> Presumably the shingles referred to in Rykeil’s report were roof shingles, but this author did not find these receipts.

<sup>15</sup> Joseph D. Conwill, “Research Notes and Annotated Bibliography for HAER Covered Bridge Project 2002,” typed notes.

<sup>16</sup> The state paid approximately 60 percent of the assessment value of the property to the heirs.

the preservation and operation of the Hyde Hall mansion. The state managed the site from 1964 to 1987, “during which time they stabilized the hall and re-roofed the entire structure.”<sup>17</sup> The building deteriorated faster than the state could save it, so they eventually proposed demolishing it.

Owing to the sorry state of disrepair that the house had fallen into over the years, the threat of demolition was a very real one. [The] intervention of the Friends of Hyde Hall, Inc. ...succeeded in having the hall recognized as a national landmark and encouraged the state to maintain it for the public’s use and enjoyment.<sup>18</sup>

In 1988, Friends of Hyde Hall acquired a thirty-year lease on the property and took on the responsibility of raising funds for the restoration, maintenance and operation of the estate as a house museum and regional cultural center.

The covered bridge, which is within the physical boundaries of Glimmerglass State Park, has been owned and maintained by the New York State Office of Parks, Recreation and Historic Preservation since 1963. It was bypassed in 1965 when the entrance road to Glimmerglass State Park was constructed and a new concrete bridge built just west/downstream. The bridge is currently an integral part of the park’s trail system, a section of which follows the old road alignment.

### **Cyrenus Clark**

Cyrenus Clark was born in Connecticut in 1772 and came to Otsego County, New York around 1800 with his twin brother Cyrus. The brothers practiced carpentry in Cooperstown, and built the Presbyterian Meetinghouse in 1805.<sup>19</sup> Beginning in 1818, Clark did masonry and woodwork at the Hyde Hall estate.

### **Burr Arch-Truss**

Theodore Burr was born in Torrington, Connecticut in 1771 and died at Middletown, Pennsylvania in 1822, but spent most of his life in Harrisburg, Pennsylvania. His father was a millwright, and Theodore learned construction at an early age. As a young man, Burr moved to Chenango County, New York, established a saw and grist mill, and shortly thereafter built his first bridge, a timber stringer span, in Oxford, New York in 1800. Within a short time, he began getting requests to build bridges throughout the northeast. He erected a 440’ drawbridge at Catskill in 1802, a 330’ arch bridge across the Mohawk at Canajoharie in 1803, and a five-span bridge over the Delaware River at Trenton, New Jersey in 1806.<sup>20</sup>

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<sup>17</sup> Pat Goldstein, “Historic Hyde Hall Undergoes Restoration,” Oneonta Daily Star, May 29, 1996.

<sup>18</sup> Ibid.

<sup>19</sup> Helen A. Ross, “History of the First Presbyterian Church of Cooperstown, New York,” The Otsego Farmer, January 25, 1952.

<sup>20</sup> Allen, Covered Bridges of the Northeast, p.14.



Until the mid nineteenth century, mathematical engineering analysis was virtually unknown, and bridges were designed by empirical method, that is, by a combination of intuition, experimentation and practical experience. The combination of arches and trusses in bridge design is seen as early as the sixteenth century in the writings of Italian architect Andrea Palladio (1518-1580), who is reportedly the first to illustrate and build a truss bridge.<sup>21</sup> In 1764 a wooden bridge was built in Switzerland with “trusses consisting of rectangular frames supported by massive arched ribs.”<sup>22</sup> America’s pioneer bridge builders Timothy Palmer and Louis Wernwag, who preceded the work of Burr, built bridges that were a highly indeterminate combinations of arches and trusses. Nevertheless, Theodore Burr is credited with being the first to separate the truss and arch to make a bridge with a level deck.

In 1806 and 1817 Burr took out patents for a multiple kingpost truss with arched reinforcing ribs.<sup>23</sup> Burr’s predecessor, Timothy Palmer (1751-1821), who is believed to be the first American bridge builder to advocate weatherboarding and roofing bridges to protect them from exposure to the elements, also designed combination arch-truss bridges, but Burr took the concept further by carrying the below-deck arch ribs of Palmer’s last bridges up into the truss, thereby leaving both the deck and truss horizontal.<sup>24</sup> By combining the arch and truss into a single structure, it appears that the strengths of each form are called into play, and the two structures work simultaneously as an integral system, each carrying part of the load, increasing rigidity and reducing deflection under load.<sup>25</sup>

In an effort to reduce the need for complex joinery, Burr in his 1817 patent recommended eliminating mortise connections at the posts and diagonals, advocating instead, “merely butting suitably mitered ends to save much of the carpentry effort and expense.”<sup>26</sup> Thus, ordinary carpenters were able to erect Burr arch-trusses, which only increased the popularity of this type.

The Burr arch-truss was popular in the mid-nineteenth century for railroad bridges and highway spans of 100 feet or more. According to one source, thousands of such bridges were constructed, particularly for longer spans.<sup>27</sup> The longest single-span wooden covered bridge on record, the 360’ McCall’s Ferry Bridge in Pennsylvania, was a Burr arch-truss. Today, there are as many as 215 wooden covered bridges classified as Burr arch-trusses remaining in the United States.<sup>28</sup> The vast majority of these are located in Pennsylvania and Indiana.

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<sup>21</sup> Andrea Palladio, Four Books of Architecture, 1570.

<sup>22</sup> J.G. James, “The Evolution of Wooden Bridge Trusses in 1850,” Journal of the Institute of Wood Science, June and December 1982, p.124.

<sup>23</sup> Richard Allen gives a date of 1804 for this patent. The patent was lost in the 1836 U.S. Patent Office fire.

<sup>24</sup> James, “The Evolution of Wooden Bridge Trusses,” p.171.

<sup>25</sup> See “Pine Grove Bridge,” HAER No. PA-586.

<sup>26</sup> According to covered bridge historian Joseph Conwill, “As built, nearly all Burr trusses have the braces notched into the posts instead. This is no doubt more secure, but the simplicity of framing was thereby lost.”

<sup>27</sup> Brenda Kreckeler, Covered Bridges Today (Canton, Ohio: Daring Books, 1988), p.18.

<sup>28</sup> There are perhaps ten more classified as Burr variations. National Society for the Preservation of Covered Bridges, World Guide to Covered Bridges, computer database printout, April 2002.

The Hyde Hall Bridge is an unusual example of an early Burr arch-truss with counterbraces in the panels instead of the more common multiple kingpost design. The X-panel truss was used in conjunction with a Burr arch in the early 1800s and is rarely found today.<sup>29</sup>

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<sup>29</sup> The Philippi Bridge in West Virginia is one of the most famous examples of this type.

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